DOCUMENT RESUME

ED 276 834 CE 045 885

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TITLE Problems with the Development of Technology in the South Pacific and Its Implications.
PUB DATE Dec 86
NOTE 15p.; Paper presented at the Annual Convention of the American Vocational Association (Dallas, TX, December 5-9, 1986).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Appropriate Technology; *Culture Lag; *Developing Nations; *Educational Needs; Engineering; Futures (of Society); Industrialization; Information Transfer; Modernization; Postsecondary Education; Science and Society; *Technological Advancement; *Technological Literacy; *Technology Transfer
IDENTIFIERS *South Pacific

ABSTRACT

The problem with developing technology in the South Pacific is similar to that of most developing countries. The size of these island nations and the market alternatives compound the problem in the South Pacific. Although there have been some piecemeal efforts in the South Pacific to develop technology, none has made more than a limited impact. In general, five major problem areas can be noted: (1) lack of explicitly formulated technology policies at national and regional levels; (2) no agency to compensate for the lack of communication with foreign sources on technology innovations; (3) agencies and institutions not executively structured so that they become locally dominant; (4) lack of professional associations that approach international standards; and (5) inadequate local training for supporting groups of technicians. Although these issues may appear to be very broad and general, it is from these general problems that the South Pacific suffers from detailed frustrations. If the problems can be solved at the general level, then most of the specific problems will be solved. That is possible with conscientious efforts by the island nations. (KC)

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Round Table Paper for AVA conference 1986,Dallas Texas, USA
December 1986

PROBLEMS WITH THE DEVELOPMENT OF TECHNOLOGY IN THE SOUTH PACIFIC AND ITS IMPLICATIONS

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INTRODUCTION

In my attempt to discuss the problems in the South Pacific I will confine myself to the eleven South Pacific countries that are members of the University of the South Pacific where I work.(Fiji Islands, Tonga, Western Samoa, Kiribati, Nauru, Cook Islands,Niue, Tokelau, Vanuatu, Solomon Islands and Tuvalu).The simple reason being I am better equipped because of the various interactions I had with these island nations in the course of my profession.

The South Pacific region is vast, stretching from the Kiribati in the north to the Kingdom of Tonga in the south and the Solomon Islands in west to the Cook Islands in the east. The countries and territories vary enormously in area, size and population. Tokelau has a population of 1,600 people compared to Fiji which has 750,000. The difference is not only in terms of population but also in economics, politics and structure.
The geography of the island nations varies from the high volcanic type(like Western Samoa) to low coral atolls like the Tokelau Islands some of which are less than 1km across, and three metres above the sea level.

Politically the region is diverse ranging from independent Island nations, Kingdoms and Nations that still maintain close relations with U.K., U.S.A., France and New Zealand.

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The geographic and political diversity is matched by the people and the cultures. The South Pacific region comprises three main cultures: Micronesia, Melanesia and Polynesia. There are about 1000 different languages and many more dialects.

In the Pacific Islands many of the problems of the less developed countries tend to look more serious; dependence, trade concentration, degree and type of manufacturing. Capacity to effectively utilize aid, poor technical manpower base and probably the lack of critical size for many research projects. Many consumer goods cannot be locally produced/manufactured unless there is export potential due to small domestic markets.

These island nations have further problems of limited resources and isolation from each other and from the major markets which subsequently increases transportation costs. Smallness of size imposes constraints which can compound problems in the development process (especially for import substitute industries).

The small island nations that I am refering to are presently undergoing transition from traditional, subsistence living to an individual money based economy. In the process of this development the gap between the rural/urban and traditional/ modern sectors has increased tremendously.This is partly due to the greater dependence on externally generated technology which allows dominance by foreign agencies.

The scope of this paper is to provide on overview of the problems associated with the development of technology in the South Pacific . It does not intend to be exhaustive.

The term Technology as discussed in the paper refers to the application of scientific principles to achieve practical objectives . Even though it could be in any sphere of life the practical objectives as envisaged by the writer for the purpose of this paper relate to Industry and Technology.

UTILIZATION OF KNOWLEDGE

The lack of up to date information on internationally available techniques which are appropriate to our needs is a major drawback. Because of the isolation in terms of distance of the small island nations from the so called "super powers" in technology they are left unaware of the advancement in the field. The most predominant mode of technological information flow is provided largely through informal personal contacts rather than an institutionalised dissemination of literature. It is unrealistic to expect a region or country to develop technology in isolation - it is even more serious to expect that of the Pacific region with their limited resources . There are many regional agencies for acquisition and delivery of economic social and cultural information.The technological developments and innovations are grouped under these 'Development' agencies. Although technology and development complement each other the need for an independent agency to gather and deliver scientific and technological information is essential . It is even more important that this agency select information suited to the local needs. In particular information must be adapted to the scale and requirements of the local society and cultures if it is ever to be effectively utilized. The lack of technological information transfer is so acute in the Pacific that even the neighbouring nations are unaware of developments in adjacent countries .

The islanders are often blamed for being disinterested or "half hearted" towards inquiring about such information , but this often is the greatest mistake outsiders make. The cultural set up and the geographical isolation in terms of communication and transportation is the hinderance. The above socio-cultural factors makes South Pacific societies not able to acquire knowledge about scientific and technological processes as easily and in so informal a manner as their counter-parts in the more industrialized world. Thus the need for an agency to monitor information dissemination is very critical . Recently (mid 1986) a meeting was convened by the Commonwealth Secretariat in Port Vila (Vanuatu) with a view to get the regional nations to consider setting up such an agency. (South Pacific Agency for Technical and Vocational Education). It is proposed to have it attached to the University of the South Pacific under the umbrella of either Department of Technology or Institute of Education . The existing library facilities , other resources and the regional nature of the University make it favourable location for the proposed agency . The deliberation at the Port Vila meeting overlooked a major area in development of technology which is the involvement of the industrial sector. In my opinion the responsibility of the proposed agency is very narrowly defined . It concentrated only on the training needs for technology development and acting as a resource base for the region. The agency should also lend itself as consultants to industries on the type of external technology that should be accepted for the good of the nation, and such considerations as operational efficiency etc.

ADAPTATION TO/ OF TECHNOLOGY

Within the region there is a tendency for the few technological specialists to assume that scientific knowledge

automatically leads to the technical "know how". Knowing that scientific knowledge exists is not sufficient to assume that it will be automatically transferred into practical purposes for the regional nations. The development of technological knowledge is straight forward provided there are funds and expertise available. This is relatively easy to accomplish in developed countries, but the locally acceptable transfer of technology is much more difficult because it involves many cultural, personal and psychological adjustments by the consumers of technology. Due to the lack of sympathy for the cultural/traditional implications of new technologies a large number of useful projects have failed. It has also seen well meaning expatriate consultants and advisers frustrate themselves in their pursuits to bring about technological changes in the Pacific. The failure of these projects has often been blamed on half hearted corporation of the islanders' when the real problem is the alien nature of the technologies involved in the development projects. The islanders tradition and culture and their isolation makes an early childhood introduction to technical skills rare . This puts an additional burden on the current learning networks when the introduction of industry and advanced imported technology is contemplated. The introduction of these new technologies should not be rushed . Most Multinational Corperations whose prime concern is profit because they have a responsibility to their shareholders , often overlook the social implications. These new technological developments should be cautiously sequenced so that there is a willing process of acceptance .

An excellent example of this is the introduction of computers in the region. Computers were just there overnight with no formal literacy programmes to equip the people of the region to adjust to the changes in life. People also had little knowledge through

informal contacts , and as we have discussed the problem with this informal personal contact approach to learning is not favourable to the Pacific islanders.In more industrial societies the exposure to the new technologies allows it to be assumed that people have some knowledge of the new technologies ,but the same assumptions can be disastrous in the Pacific.People once confronted with this change tend to resent it and build a"cold front" towards the new technologies. It will then take a long formal education process to make them accept it . People are not aware of the usefulness and the adaptability of the new technologies and the fear of being displaced from the job market causes rejection of the technological developments.For the successful implementation of new technologies an adaptation of technology and an adaptation to technology is necessary. Externally developed technology should perhaps be modified in some cases to suit the local needs and cultures , so as to avoid alienation of the islanders from their societies.On the other hand the Pacific islanders should be prepared to adapt to the new demands of technological development . To eliminate the feeling of uncertainty regarding the new technologies the following phases of transition would help :

1) A preparatory period for the people who will be the recipients of the technology inorder to ascertain their needs and views , together with an assesment of possible impact of the technology transfer .

2) A period of preparation of specialists who are to facilitate the transfer of technology so that they are sensitively attuned to the way of life of the recipients.

3) A period of follow up and training of local people in all the relevant skills so that the technology does not languish after withdrawal of the foreign consultants.

4) Periodic review to equip the locals using the technology

with the current developments in that technology. This is where a good technology information system provides information regarding the training needs necessary to avoid becoming obsolete.

INSTITUTION and TECHNOLOGY DEVELOPMENT

The major institutions with the capabilities for technological research and development in the South Pacific region are : The University of the South Pacific,South Pacific Commission,South Pacific Bureau for Economic Co-operation and the Fiji Institute of Technology.The co-operation between these major institutions is loose and informal. This is largely due to lack of technology implementation policies by the regional nations which makes it hard for the regional leaders and the institutes to come to any agreement on more organized co-operation. Due to the lack of co-ordination of the activities in these various Institutes of Higher Learning there is a lot of duplication of activities which causes a lot of foreign aid to be wastefully utilised. If one takes a look around the regional countries , they all have some sort of Technical Institute , which in some cases,is excellently equipped but the contribution made by such Institutions is often questionable. However there are few a Institutes that deserve commendation on their contribution,namely,the INR,IMR and FNTC (Institute of Natural Resources and Institute of Marine Resources based at USP,Fiji National Training Council). A lot of these Institutions are too engrossed with manpower training/teaching and thus ignore the area of consultancy and R & D(Research & Development). Many argue the advisieability of lesser developed nations involving themselves in the costly process of R&D-prefering to judiciously select the appropriate results of others R&D .The above statement is true , but you still need to select the appropriate results and utilize it to local needs. This is

the type of R & D I envisage as very much needed in the Pacific. The University of the South Pacific , in collaboration with the Fiji Institute of Technology ought to set up a Institute of Industrial Technology (like IMR&INR) to provide consultancy to the region on areas such as manufacturing and quality control which is a growing industry in the Pacific.The institutions are often confronted with financial constraints and lack of qualified personnel in order to provide such services, in the initial stages or it may be suffering from what we discussed earlier as not sufficient locals trained to continue operations when the foreign consultants leave.

Since these institutes are seen as facilitators of the pursuit of excellence of knowledge they should be able to advise the region in the selection of external technologies rather than depending on advice from individual companies who often have to operate on a commercial basis . The establishment of these institutions largely depend on foreign aid from donor countries who often try to impose technologies which the Pacific island institution and nations cannot afford to reject. Consequently the Pacific sometimes becomes the dumping grounds of obsolete (in terms of Industrialised Societies) technology. I welcome aid, provided it seeks the wishes of the island nations. Institution like the USP and FIT should be enabled to help select the type of aid and technologies to be brought into the Pacific. These institutions should perhaps teach the policies of technological decision making to the regional students and administrators.

Another major problem with these institutions is that they are staffed by expatriates from developed countries who are inclined to teach programmes suited to areas of their expertise irrespective of the usefulness of such technologies to the

Pacific Nations. This is perhaps because they are not taught the needs of the region, and have little time to learn those needs. Even policy decisions regarding priorities in technology development at these institution are left in the hands of a few who , although well-meaning , are not able to appreciate the real needs of the region.The other very serious problem with the staff at these regional institutes is the high turnover of the staff especially at the University of the South Pacific, where in some cases before a new technology is fully developed and well established, the staff moves on to more attractive jobs in the developed countries.This may be due to the fact that the expatriates feel threatened by the automatic international advertising for their posts after only six years or in some cases even less. The positions should also be made more lucrative in terms of salaries and working conditions in order to attract well qualified staff from outside the Region.

I do not want to paint a negative picture that all these institutes have failed in promoting technology developments in the region. That is far from the truth. In fact, given the resources (finance, equipment & staff) these institutes have made remarkable contributions to technology development. However, there are a few problems which a little extra thought may solve.

MANPOWER SUPPORT FOR TECHNOLOGY DEVELOPMENT

Lack of suitable manpower has been a major drawback in Development of Technology in the Pacific. There is a drastic shortage of qualified personel with technical/scientific "know-how" in the Pacific nations. In 1977 there were approximately three QSE's (Qualified Scientific Engineers) per ten thousand population working on civil projects of whom only

20% were locals. Thus the majority of the QSE's in the region are ill equipped to appreciate & judge local problems & priorities (because they are expatriates).

In the regional island nations it is difficult to afford many QSE's out of their meager budget but yet they need them for development and progress. Consequently, it is very common to find one engineer wearing many different 'caps'. In 1983 Tonga had one civil engineer as the Water Board Manager, Roads Engineer and the Government's Representative on solar technology. How much can you expect of an individual under such circumstances? Training needs, with special references to secondary teaching of technology and science, should encourage people to enter science and technology as a career. There should be provisions made within the national infrastructure for technological careers with appropriate rewards . Provision for ongoing training after the initial training period should be made available, especially to retrain personnel to adjust to changing technologies. This is often ignored either because of lack of financial resources or the inability to find replacements during the absence of the officers undergoing training.

The South Pacific region suffers from the crippling need for a supporting stratum of technicians which will enhance the efforts of the limited members of QSE's. Brain drain to richer societies able to pay higher wages and provide better conditions is also straining the limited manpower in the regional countries.

Institutions and agencies sponsoring higher education in the developed countries with professed dedication to development of technology in the Pacific often encourage Pacific islanders to read for higher degrees prolonging their absence from home. This

often upsets the development plans and policies with failure to have personnel to fill the jobs. While the island nations appreciate the value of higher education they cannot have people away for long periods. Education and training should be interspersed with long periods of service to the developing countries.

With the upper bracket of QSEs being currently met by appointment of expatriates there is the new problem concerning the recruitment of trained middle level technicians. ILO, CFTC and various other such organisation are at present trying to revamp programme in the regional technical institution to meet the needs of this level of technicians. In response to the shortage of manpower the University of the South Pacific conducted a survey to determine the type of Technical Assistants the region needed and from the outcome of the survey the new Bachelor of Technology degree was designed. The graduates of this programme will be able to relieve the QSE's to attend to other projects while they coordinate and supervise the daily operation. Their position in the hierarchy would be between the QSE's and the technicians.

Potential technologists fail to enter the education systems abroad because of selection criteria at the entrance level to foreign Universities. This points to the need to investigate alternative methods of training. United Nations Organizations, and the Commonwealth Funds for Technical Co-operation and other such organisations have contributed significantly to training technologists in the Pacific, but again due to lack of coordination and control of policies by the island nation, very few constructive achievements are seen. For instance one island instructor at a technical institute was given short term training three times by three different organisations and all three

training programmes were at the same level and on the same technology.

In response to the problem of obtaining acceptance in foreign Universities the University of the South Pacific has a pre-engineering year which equips the regional students with the necessary background to pursue studies in the engineering field. This programme has been accepted as the first year of the engineering degree by few Australian Universities and the University of Hawaii,USA.

There is also the problem of overlap in programmes at many of these Pacific Institutions and no system for cross crediting from one institute to the other . Sometimes students go through the same material with not much gain each time they obtain a training award.

Problems relating to training are basically associated with the lack of policies for introduction and implementation of new technologies. Often the technology comes to the Pacific prior to any training/education of the recipient. And then whatever training is done is haphazard which does not help much.

CONCLUSION

The problem with developing technology in the Pacific is similar to most developing countries. The size of these island nations and the market alternatives compound the problem in the Pacific. There have been a number of piece meal efforts in the South Pacific to develop technology. Despite commendable efforts by individuals and institutions, none have made more than a very limited impact. These efforts should no doubt continue with more

definite policy commitments by those concerned.

In this paper the intention was to discuss the problems in a general way rather than cover specific details.

To summarise, the problems discussed in the paper are:

1. Lack of explicitly formulated technology policies at National and Regional levels.
2. No Agency to compensate for the lack of communication with foreign sources on technology innovation.
3. Agencies and institutions are not executively structured so that they become locally dominant.
4. Lack of professional associations of technologists which approach international standards. Consequently there a very few local technological publications.
5. Inadequate local training for supporting groups of technicians.

The issues discussed may appear to be very broad and general but it must be realised that it is from these general problems that we suffer from detailed frustrations. If we can solve the problems at the general level then most of our specific problems will be solved. I am convinced that it is possible to overcome a lot these problems with conscientious efforts by the Island nations.

I wish to thank you all for giving me this opportunity to be with you and share my views on this very serious issue for our South Pacific Region. I wish to extend my heartiest welcome to any participant who may decide to visit the University of the South Pacific.

"Vinaka vakalevu!" Thank you

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